



REPORT

ON

SEED MULTIPLICATION SCHEMES

RAJASTHAN

सत्यमेव जयते

Committee on Plan Projects
SEED MULTIPLICATION TEAM

JULY 1961



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**Committee on Plan Projects
SEED MULTIPLICATION TEAM**

JULY 1961

LETTER OF TRANSMITTAL

Dr. R. NAGAN GOWDA,

No. COPP/SMT/784/61

*Leader,
Seed Multiplication Team.*

COMMITTEE ON PLAN PROJECTS
PLANNING COMMISSION

SUDARSHANA GUEST HOUSE

Bangalore-1, dated 19th Sept. 1961.

Dear Shri Shastriji,

SUB:—*Report of the Seed Multiplication Team, Committee on Plan Projects,
for Rajasthan State.*

I have great pleasure in forwarding to you the report prepared by the Seed Multiplication Team, Committee on Plan Projects, for the Rajasthan State.

This State is made up of several princely States and has a total area of 1,32,000 square miles of which there is a total cropped area of 338 lakh acres. In spite of low and erratic rainfall averaging below 35 cm. both Rabi and Kharif crops are grown. Bajra occupies the largest area of 97.61 lakh acres among the crops grown in the State. Jowar is grown predominantly in Kotah Division and maize in Udaipur Division. Rabi crops such as wheat, barley and gram are grown all over the State except the desert areas of Jodhpur and Bikaner Divisions. Wheat is grown in mixture with barley, gram or sarson occupying about 29.65 lakh acres. Gram among the Rabi crops occupies the largest area of about 43.08 lakh acres. Cotton and sugarcane are only important cash crops occupying about 586 lakh acres and 69,000 acres respectively the former as rainfed and irrigated and the latter under irrigation only. The oil-seeds including groundnut, sesamum, rapc and mustard occupy about 23.82 lakh acres or about 7 per cent of the total cropped area. Pulses occupy about 46.39 lakh acres.

The Team has examined in detail the existing arrangement for multiplying and distributing improved seeds of crops and has made recommendations to intensify research and affect a large scale distribution of seeds to reach the cultivators.

The recommendations of the Team are given in Chapter XI. The phasing of the seed programme with priorities for intensifying breeding work on bajra, maize, jowar and gram have been made. Recommendations have been made for improving the set-up of research organisations in the State to meet the requirement of crop improvement in hybrid maize, jowar and gram. The Team finds that the programme drawn up by the State Agricultural Department for the Third Five Year Plan would cover only small percentage of the targets required to saturate one-fifth of the cropped area every year, gram, oil seeds,

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kharif pulses and jowar. The Team has therefore recommended an increase to at least 60 per cent of saturation requirements of these crops with an intensified programme of multiplication and distribution of seeds of the available improved varieties by utilizing the services of Village Panchayats and Gramsahayaks.

The Ministry of Agriculture is in general agreement with the recommendations of the Report and their comments are given in Appendix VII. The Report has also been examined by the Agricultural Wing of the Planning Commission. The State Department of Agriculture has generally agreed with all the recommendations made by the Team.

With best regards,

Yours sincerely,

R. NAGAN GOWDA

SHRI LAL BAHADUR SHASTRI,

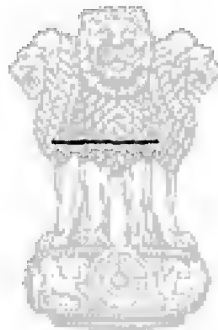
*Minister for Home Affairs & Chairman,
Committee on Plan Projects, New Delhi.*



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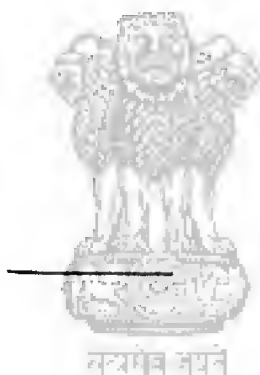
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P R E F A C E

The Seed Multiplication Team was constituted by the Committee on Plan Projects, Planning Commission in COPP (6)/1/59 dated 10-5-1960. The Terms of Reference were—

I. To make an appraisal of the various seed schemes in existence and make suggestions as it may consider necessary having regard to the following—

- (a) Sufficiency of the programme from the point of view of the needs of the country for the supply of pure seed of improved varieties.
- (b) Comparative economics of various types of seed schemes with a view to better programming and planning of the future.
- (c) Priorities of the programme and its phasing in relation to the needs from time to time.
- (d) Progress of work under various types of schemes selected at random and the causes which may hamper or impede progress and the remedies for them.
- (e) Effectiveness of distribution arrangements at various stages for supplying pure seed to the farmers.
- (f) The extent of trading operations carried on by the Agricultural Department for the supply of pure seed to the cultivators and the necessity of employing technical officials for undertaking these trading operations.
- (g) Co-ordination among different agencies engaged in breeding, production and distribution of pure seeds, and
- (h) Any other point that may be considered relevant to the objectives for which the Seed Multiplication Team has been appointed.

II. To employ the method of case studies and flow sheet analysis and to consult local interests in the area which the Team visits in order to make an assessment of the acceptability of the programmes which are being implemented for the benefit of the persons concerned.

III. To discuss the results of the Team's analysis with the persons engaged on the programme and their controlling officers.

This Report is the sixth in the series now being issued by the Team. This State was reorganised during 1948 to 1950 by the inclusion of a number of Princely States and is the second largest in India. The cropped area of this State is 34 million acres. There are vast tracts of arid waste with a very low rainfall in this State and therefore with adequate irrigation facilities, use of improved seeds and cultural practices, the agricultural productivity of this State can be vastly increased. The chief crops of this State, in order of importance of area, are bajra, gram, wheat, jowar, maize and barley, and in the order of production wheat, gram, bajra, barley, maize and jowar.

Rajasthan is one of the first States in India to entrust development work to the decentralised democratic administration of the Panchayats. The scheme has worked for an year from 1959 and the functions include the multiplication and distribution of improved seeds of crops. There is therefore need for proper co-ordination between the Panchayat organisation and the Research and Developmental wings of the Agricultural Departments. In this Report recommendations are made to intensify research and phase the developmental programme so that improved seed can saturate the large part of the area of important crops by the end of the Third Five Year Plan.

The Team visited the districts of Jaipur, Jodhpur, Udaipur and Ajmer between the 9th and 13th January 1961 and held discussions with the Honourable Minister for Agriculture and officers of the Agricultural Department. The Team also examined the research work done at Durgapura and Tabiji Stations. State Seed Farms in Sardargarh, Tabiji, Durgapura Bassi and Mandore were visited. The Team had also discussions with Registered Growers and Cultivators at Kankrauli. A list of places visited and persons interviewed is given in Appendix III.

Our thanks are due to the Government of Rajasthan and to the Minister for Agriculture Shri Nathuram Mirdha for facilities given. The Government of Rajasthan were consulted on this Report and many valuable suggestions offered by them giving up-to-date data, have been incorporated in this Report. The Team also expresses its thanks to Shri Shiva Shankar Sharma, Secretary, Agriculture Department, to the Director of Agriculture and Joint Director of Agriculture. To Shri U.S. Badal, Deputy Director of Agriculture, and to Shri M.P. Bhatnagar, Economic Botanist, the Team is indebted for valuable help rendered during the tour. The Team also expresses its appreciation to Shri R.B. Ekbote, Senior Research Officer for assistance in the preparation of this report. To Dr. K. Ramaiah, Adviser, the Team is indebted for very valuable help and advice rendered at all the stages of its work.

The Director of Agriculture arranged the visit of the Team to several places and also supplied valuable information connected with seed multiplication work in the State. This Report is based on the enquiries made by the Team and on the data supplied by the Director of Agriculture.

DR. R. NAGAN GOWDA
(Leader)

THAKUR PHOOL SINGH
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SHRI BOSHI SEN
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CHAPTER I

PHYSICAL FEATURES, CROP PATTERN AND SEED REQUIREMENTS

(1) *Physical Features*—The State of Rajasthan was formed by the integration in 1948 and 1949 of several small States of Kotah, Bundi, Jhalawar, Udaipur, Banswara, Dungarpur, Kishangarh, Shabpura, Tonk, Pratapgarh, Jodhpur, Bikaner, Jaipur, Alwar, Karauli, Dholpur and Bharatpur. Sirohi State merged in 1950 and the Abu Taluka and the centrally administered Ajmer were included on November 1st 1956. The total area of the State is 1,32,000 square miles.

For administrative purposes there are five Divisions and twenty-six districts in Rajasthan. The Aravalli hills divide the State into two main zones namely the North-west or the sandy and arid part and the relatively fertile zone of the South East. About two-third of Rajasthan lies North West of the Aravallies and one-third on the South-east. The North-west region consisting of Jaisalmer, Bikaner, Jodhpur and Shakhawati of Jaipur division is covered by sand dunes excluding the fertile region on the banks of Luni river. The soil is sandy and undulating but capable of yielding a fairly good crop under irrigation. The average annual rainfall, however, is below 35 cm. and therefore there are difficulties in cultivation. In years of drought, the farmers are forced to migrate to distant places in search of water and fodder for their cattle.

The Eastern side of Aravallies is traversed by a number of rivers and in many parts there are wide valleys, fertile table land and large tracts with excellent soil. The Eastern plateau of Rajasthan gradually falls into the catchment area of Betwa river and opens out towards Bharatpur in the alluvial basin of the Jamuna. The rainfall here varies from about 35 to 80 cm and the sub-soil water is available between 30 to 100 ft. depth. There are many large tanks in Ajmer and Udaipur Division and Bundi district of Kotah Division.

Soils—The North-west region has generally sandy soil while in the South-east it varies from sandy loam to clay loam. In certain parts the soil is mixed up with stones. In the vicinity of Kotah Division and in the District of Banaswara of Udaipur Division black soil is found. This soil is retentive of moisture and produces good winter crops without irrigation.

Irrigation—Of the total cropped area of 338 lakh acres only 40.9 lakh acres or about 12 per cent are irrigable in 1960-61, two-third from wells and a fifth from Bhakra Chambal and Rajasthan canals. By the end of the Third Five Year Plan, another 20 lakh acres would be brought under irrigation from the major, medium and minor works.

(2) *Crop Pattern*—In spite of the sandy nature of the soil in the North-west region and low and erratic rainfall all over the State, both Kharif and Rabi crops are grown. The main crop of the desert area of Jodhpur and Bikaner Divisions, the Jhunjhunu and Sikar districts of the Jaipur Division is *bajra*. This crop occupies the largest area among the crops grown in the State. *Jowar*

is grown predominantly in Kotah Division and Maize in Udaipur Division. Rabi crops such as wheat, barley and gram are grown all over the State except in the desert areas of Jodhpur and Bikaner Divisions. Cotton is grown in Sri-Ganganagar, Chittor, Bhilwara, Udaipur and Jhalawar districts, also under irrigation.

Bajra—Bajra is the most important food crop grown in Rajasthan occupying the largest area of 97.61 lakh acres and about 30 per cent of the cropped area. It is sown after the out-break of monsoon in the month of June or July. The crop is seldom irrigated except in parts of Ganganagar District and ripens in the month of October and gives a very low average yield of about 200 lbs. per acre.

Jowar—Next to *bajra*, *jowar* is the important Kharif crop grown over an area of about 26.18 lakhs of acres. It forms the staple food crop in the Kotah Division and is also an important fodder crop. It is sown in June or July and is harvested in October and November. This is almost exclusively rainfed and the average grain yield per acre is only about 250 lbs.

Maize—Maize is mostly cultivated in the Udaipur Division and to a little extent in Jaipur, Sawaimadhopur, Tonk and Alwar districts. This is grown during *Kharif* season and is sown in June-July and harvested by the month of October. Soils of Udaipur Division are very suitable for this crop. The average yield is about 890 lbs. per acre.

Wheat—Cultivation of wheat is evenly distributed throughout the State excluding the desert area. It is grown in mixture with barley, gram or sarson over an area of about 29.65 lakhs of acres. Wheat is generally grown under irrigation except on heavy soils receiving high rainfall. It is sown in October-November and harvested by April. In Ganganagar Canal Colony the crop season is somewhat longer. The average yield for the State is about 800 lbs. per acre.

Barley—Barley is grown over an area of about 14.17 lakh acres in place of wheat in areas of light soil or having scanty irrigation water. It is sown in October-November and harvested in March-April. The average yield is about 1000 lbs. grain per acre.

Gram—Among the Rabi crops, gram occupies the largest area of about 43.08 lakh acres. It is either grown pure or mixed with wheat and barley as a rainfed crop except in Ganganagar District where the crop is given one or two irrigations. The average outturn of the crop is about 500 lbs. per acre.

Rice—The rice crop covers an area of only 2.47 lakh acres and its cultivation is confined to Dungarpur, Banswara, Bundi and Kotah Districts having heavy soil and sufficient rainfall. Transplanted paddy is generally of finer types while that broadcast is of coarse type. The average yield is of the order of 1000 lbs. of cleaned rice per acre.

Cotton—Cotton is an important cash crop grown over an area of about 5.86 lakh acres. Its cultivation is increasing gradually. It is grown both as a rainfed crop and also under irrigation in Chittor, Udaipur, Jhalawar and Ganganagar and to some extent in Bundi and Pali districts. Under *barani* conditions it is sown in June-July and under irrigation, in May. The average out-turn is 365 lbs. of seed cotton per acre.

Sugarcane—Sugarcane is another cash crop grown over an area of about 69,000 acres. It is planted from February to April and harvested from middle of October. Its cultivation is mostly confined to the lands having irrigation facilities in Ganganagar, Bharatpur, Sawaimadhopur and Tonk Districts. The crop is generally used for the manufacture of Gur. But, in Ganganagar and Bhopalsagar having sugar factories the Coimbatore canes have almost replaced the local varieties. The average yield is about 2500 lbs. per acre of Gur.

Oilseeds—Groundnut, sesamum, rape and mustard are among the oil seeds grown in Rajasthan. The total area under oil seeds is 23.81 lakh acres or about 7 per cent of the total cropped area.

Pulses—Arhar, moong, urad, moth and cowpeas are the different pulses grown in this State. The total area occupied by them is about 46.39 lakh acres.

(3) **Seed Requirements**—The acreage, production and the annual requirements of seeds in respect of the important crops grown in this State are given below. The seed requirements are calculated on the basis of saturating 1/5th of the total cropped area every year and on the seed rates prevalent in the State except for hybrid maize for which the requirements of the whole area is to be produced every year.

TABLE I
Area, Production and Annual sufficiency of Seed Requirements of important crops 1959-60

Name of crop			Area in (000) acres	Seed rate (lb for acre)	Annual sufficiency of Seed requirement for 1/5th of the cropped area (Tons)
Cereals—					
1. Bajra	..	..	97,61	4	3,486
2. Wheat	..	..	29,65	80	21,180
3. Jowar	..	..	26,18	10	2,338
4. Maize	..	..	14,96	20	13,300
5. Barley	..	..	14,17	80	(Hybrid seed) 10,100
6. Rice	..	..	1,68	40	600
Pulses—					
7. Gram	..	..	43,08	40	15,386
8. Other Pulses	..	..	45,75	12	5,900
Others—					
9. Cotton	..	..	5,86	12	580
10. Sugarcane	..	..	69	3360	20,000 Setts
11. Sesamum	..	..	12,87	4	460
12. Rape and Mustard	..	..	5,17	4	180
13. Groundnut	..	..	2,12	80	1,516

It will be seen that the annual requirements of seed are considerable and how far they are met is discussed in the following Chapters.

(4) *Trend of Production*—Within the last three years the production of foodgrains in Rajasthan has risen from 39.45 in 1957-58 to 47.25 lakh tons in 1959-60, while in 1958-59 it has been 50.93 tons. While land development and improved agricultural practices exceeded the targets fixed for the Second Five Year Plan for additional production, the actual achievement of additional production due to improved seed was only 0.95 lakh tons as against the target of 2.04 lakh tons.



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CHAPTER II

RESEARCH

(1) *Organisation*—Rajasthan being a newly integrated State, the Agriculture Department is in a developing stage. The research staff consists of one Economic Botanist who is assisted by three Assistant Economic Botanists and Research Assistants. There is a separate section of Cotton Botanist for breeding improved varieties, at Udaipur. The Economic Botanist is stationed at Durgapura six miles from Jaipur. Here he has a Central Research Station where sufficient land and laboratory facilities have recently been provided. The staff at this Central Research Station, Durgapura consists of one Economic Botanist Class I, one Assistant Botanist, one Assistant Millet Botanist and one Cytologist all in Class II and Five Research Assistants. Besides, in a separate Wheat Breeding Scheme which is also located at this Station, the staff provided is one Wheat Botanist in Class II, one Research Assistant and one Testing Assistant. At the Research Sub-Station at Tabiji, Ajmer, there is one Assistant Maize Breeder in Class II and Two Research Assistants while at another Research Sub-Station Kotah there is one Assistant Economic Botanist in Class II with three Research Assistants. In the Third Five Year Plan, provision for appointment of two Assistant Economic Botanists and two Research Assistants at each of the five Regional Research Stations has been made.

Durgapura Farm has an area of only 112 acres used for Research and for small scale multiplication of nucleus seed in Stage I according to requirements.

(2) *Sufficiency of the Breeding Programme*—In Appendix I is given the list of improved varieties released for distribution, giving the details of their special characteristics, duration, yield potential, year of release and the areas to which they are adapted. These varieties have been recommended as a result of trials conducted in different regions. In the case of wheat, three strains are recommended for distribution namely R.S. 31—1 (Local \times Punjab C. 591), Punjab C 591 (T8 B \times T9) and NP 718 (NP 52 \times 165). The first one was evolved at the Central Research Station at Durgapura and the latter two are introductions from the Punjab and the Indian Agricultural Research Institute, New Delhi respectively. One local variety called Malwi Ekdaniya is recommended for—growing under rainfed conditions in the retentive black soils of Kotah Division where monsoon rains are adequate. The variety C 591 is suited to rich soils receiving irrigation, N. 718 to Jaipur, Udaipur and Jodhpur Divisions and R.S. 31—1 to Kotah also.

Of bajra and jowar, two selections each, R.S.K. and R.S.J. (*bajra*) and R.S.I. and R.S.2 (*jowar*) are for the present recommended. The jowar strains were released in 1950 and bajra in 1956. There is a demand for better strains of these crops.

In barley, gram, maize, groundnut and moong only a single improved variety of each has been evolved. These are selections from local released

between 1950-51 to 1953-54. Barley R.S.J. 17 and gram R.S. 10, are suited to all areas in the State.

(3) *Co-ordination of Research and Education*—There are three Agricultural Colleges in Rajasthan located at Udaipur, Jobner (Jaipur) and Ajmer. The Team visited the Udaipur college which has been well equipped with laboratories for research. The staff consists of a Principal, Professors of Botany, Agronomy, Chemistry etc., and Lecturers. For the present very little research on crop breeding is in progress but considerable breeding material particularly of wheat has been collected.

(4) *Suggestions for improvement of Research*—(1) The Seed Multiplication Team during its visit to the main Research Station was informed that during the Third Five Year Plan it is proposed to have a Specialist of each important crop under the administrative control of the existing Economic Botanist. In the opinion of the Team, there should be a Specialist each for millets, pulses and oil seeds with a fully equipped research section for each. The Team also recommends that there should be a Joint Director of Research to exercise administrative control over all research stations and give guidance to the crop Specialists in general.

The Team was also informed that more sub-stations for research would be established at important crop centres with necessary staff. In their initial stages, the Team recommends that a large number of trials of promising varieties from different stages along with local outstanding ones should be conducted on a Statewise basis.

(2) Bajra which occupies the largest area in the State deserves greater attention. There are only two varieties of this crop which have covered only ten per cent of the cropped area.

The Team considers that there is considerable scope for improvement of this crop by producing hybrid bajra. At Tabiji near Ajmer a sub-station of PIRRCOM (Project for Intensification of Regional Research on Cotton, Oil-seeds and Millets) has been established by the Indian Council of Agricultural Research having its main Station at Kanpur. The largest area under bajra is in Rajasthan, and the Team recommends that a main station for this crop to be located in Rajasthan should be examined.

(3) From the point of view of both area and production of Maize, Rajasthan comes third in India. A number of hybrid varieties are under trial, while during the year 1960-61 demonstration plots have been laid out on cultivator's holdings using the flint types of maize hybrids which are expected to give higher yields than the local selections. Texas 26, a hybrid from U.S.A. has given about 45 per cent higher yield than *Bassi* selection. There is no possibility of this hybrid becoming popular. Flint type hybrids like V.L. 54 and V.L. 54A have given yields 50 to 60 per cent higher than that of *Bassi* selection, while new hybrids like Ranjit Macca have given a higher yield potential. The Team therefore recommends that based on the yield trials with several strains of hybrid maize conducted in all district Farms to find out the strain or strains best suited for the region, seed production should be intensified.

(4) Although jowar occupies an area almost equal to that of wheat, improvement of this crop has not received the emphasis it deserves. This is an important food crop particularly of the poor people and there is a great scope for improvement. Considerable material has been collected at Tabiji Station and a number of hybrids are undergoing yield trials. Research on this important food crop should receive immediate attention.

(5) Gram is grown over a large area of about 43 lakh *acres*. Unfortunately not much research has been conducted on this crop. There is a single variety R.S.10, a selection from the local varieties released in 1950-51. In view of the large area under this crop and its importance as a food crop, more research is needed for evolving suitable high yielding varieties. The Team considers that a separate Research station for gram and other pulses is necessary.

(6) There is no suitable improved strain of hard wheat available for growing under un-irrigated conditions in Kotah division. The problem of breeding improved durum strain has been taken up at the Indore sub-station of the I.A.R.I., and the most promising ones belonging to the N.P. 400 series may be released.

(7) At present there is not any co-ordination between the work of Crop Specialists and the college staff. To avoid duplication of work active co-operation between them should be established for the selection of alike research problems and their extension.



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CHAPTER III

SUFFICIENCY OF NUCLEUS SEED PRODUCTION PROGRAMME

The State Department of Agriculture, has drawn up a plan for production of nucleus, foundation and Registered seed in quantities to cover one fifth of the existing crop area every year for the Second Five Year Plan and recently for the Third Five Year Plan also. The present position is as follows.

(1) *Nucleus Seed*—Nucleus seed of all the strains (of the following crops) including those which have been introduced from either the Indian Agricultural Research Institute, New Delhi or Punjab is produced within the State at the Central Research Station, Durgapura and at the Research Sub-Station at Tabiji (Ajmer) and Kotah. The quantities produced are given in Table II.

TABLE II
Nucleus Seed produced at the Research Stations (1959-60)

Crop	Variety of crops	Production (In Maunds)	Production in Mds. for crops	Requirement in Mds for saturation 1/5 of the area every year.
Wheat ..	C 591	300	1500	2862
	RS. 31	600		
	MP 718	600		
Barley ..	RS. 17	250	250	810
Gram ..	RS. 10	200	200	2079
Jowar ..	RS. 11	80	80	51
Bajra ..	RSK. 100	100	200	30
	RSG. 100	100		
Maize ..	Bassi selected	200	200	200
Paddy ..	..	..	..	14
Pulses ..	R.S. 4 Moong	20	35	130
	N. P. 29 Pea	15		

It will be apparent from the figures given above that the production of nucleus seed of selected varieties is inadequate for saturation of the area in the case of wheat (52%), barley (31%), pulses (27%) and gram (10%) and adequate in jowar, maize and bajra. The case studies of Bassi, Baroa (Jaipur) Sardargarh and Tabiji Seed Farms showed that the supply of nucleus seed was irregular and in some cases inadequate. For example no nucleus seed of wheat was supplied to Bassi Farm and Sardargarh Farm during 1958-59, whereas 16 maunds were supplied to Bassi in 1959-60 and 25 maunds in 1960-61. In the

case of Sardargarh Farm 10 maunds were supplied in 1959-60 for an area of 15 acres and 15 Maunds in 1960-61. The Tabiji seed multiplication farm which is close to the Tabiji research sub-station has been getting all its requirements of nucleus seed from the latter. In a few cases nucleus seed was supplied directly to individual farmers. Thus, both production and supply of nucleus seed requires proper planning so that the area of each crop can be satisfactorily covered once in five years.

The areas required under different crops for producing nucleus seed in adequate quantities are indicated below—

TABLE III

Area required for producing adequate quantities of Nucleus Seed of different Crops (1959-60)

Crop					Nucleus seed required (Mds.)	Area required (acres)
1. Wheat	..	..	..	..	2862	143
2. Barley	..	..	..	..	810	32
3. Gram	..	..	..	..	2079	208
4. Jowar	..	..	..	..	51	10
5. Bajra	..	..	..	..	30	8
6. Maize	..	..	..	..	200	16
7. Paddy	..	..	..	..	15	2

(2) *Suggestions for improvement of nucleus programme*—A total area of 412 acres will, therefore, be necessary to produce the nucleus seed of improved varieties of the above mentioned crops in adequate quantities. At the Central Research Station, Durgapura besides an area of 25 acres allotted for Research 98 acres are being reclaimed for nucleus seed multiplication. There is also some area assigned to this work at the sub-station at Tabiji and Kotah. Since these areas are not likely to total 419 acres, the Team recommends that the nucleus seed should also be produced at Bassi and some other State Farms under the supervision of the Research staff.

CHAPTER IV

SEED MULTIPLICATION FARMS—PRODUCTION OF FOUNDATION SEED

(1) *Number and Size of Seed Farms*—The Rajasthan State, like Madhya Pradesh, prefers to have one 100 acre Farm for a group of four Blocks, instead of the Government of India pattern of setting up one 25 acre Farm in each Block. The Team was informed that land is difficult to acquire in each block, and that from the point of view of economy of staff large size Farms were better. So far 38 Seed Multiplication Farms have been established in Rajasthan State. Most of them are approximately of 100 acres each. Three more Farms are in the process of being established and land acquisition proceedings are in progress. These 41 multiplication Farms will serve 164 Blocks. Thus thirteen more seed multiplication Farms will be set up for 40 additional Blocks. The remaining 28 Blocks are located in the desert area, where animal husbandry programme will get priority.

Most of the seed Farms have been established on Government fallow lands which are not always suitable for cultivation. For instance, the Sardargarh Farm, which the Team visited has alkaline soil and will take some time to reclaim it. The Team was informed that there are very few such Farms and even farms like Sardargarh will have special usefulness for demonstrating to the cultivators how to reclaim alkaline soils. A seed multiplication Farm of 1600 acres has been established at Wommdganj in Kotah District to supplement the foundation seed production as well as to multiply hybrid maize seed.

(2) *Area and production of Seed Farms*—The total area of the existing 38 Seed Farms is about 3871 acres and the quantities of different foundation seeds produced are given below.

TABLE IV
Production of Foundation Seed

Crop					Production in Mds. 1959-60	Quantity required in Mds. for saturation	Percentage achieved
Wheat	..	..	..	..	5,053	57,186	9.0
Barley	..	..	..	..	671	19,278	3.0
Gram	..	..	..	..	369	41,553	0.9
Jowar	..	..	..	..	133	2,511	7.3
Bajra	..	..	..	..	376	2,349	16.0
Maize (Local variety)	..	..	..	..	342	11,880	3.0
Paddy	..	..	..	..	6	810	0.8

It will be seen that the quantity of foundation seed produced at present is inadequate for all the crops and particularly in case of wheat, barley, maize, paddy and gram.

(3) *Staff*—The staff at each Farm consists of a Manager in the scale of pay of an Agricultural Inspector, one Lower Division Clerk-cum-store-keeper, one tractor-driver and five ploughmen. Besides five pairs of bullocks, a tractor is provided for each 100 acre Farm as also two pump-sets for irrigation.

(4) *Profit and loss*—The income and expenditure for 1959-60 were available for only ten out of 41 Seed Farms. The expenditure varies from Rs. 8,624 to Rs. 38,000 and the receipts from Rs. 822 to Rs. 19,042. Only in case of Sawaimadhopur and Mavli (Udaipur) Seed Farms the receipts exceeded the expenditure in 1959-60 showing a profit of Rs. 1,089 (Sawaimadhopur) and Rs. 1,193 (Mavli). Details are given in Appendix V. The State Government are of the view that it would be premature to assess the profitability of these Seed Farms as most of them are in a stage of development. (C.F. Appendix VI).

(5) *Seed Supply*—Nucleus seed for Sardargarh and Samdari Farms were supplied from Tabiji (Ajmer) Research Sub-station whereas the Barwa Farm got its supply also from Durgapura Central Research Station. In two out of eight Farms visited the supply was inadequate. The total requirements and supply of nucleus seed to the eight Farms were as follows—

TABLE V
Supply of Nucleus Seed to State Seed Farms (Mds.).
(Case studies of 8 Farms)

Crop	Quantity required	Quantity supplied.
Wheat	189	142
Gram	27	14.5
Maize	9	3.5
Moong	10	10
Barley	9.5	..
	4.0	..

For wheat, gram and maize, the supply of seeds was not adequate for full saturation, while there was no supply of barley and paddy seeds. The Team therefore recommends that the full supply of nucleus seeds should be ensured to the Seed Farms, so that the seed programme is rendered effective.

(6) *Yield per acre in State Seed Farms*—In planning the seed production, for the Second Five Year Plan the Agricultural Department, Rajasthan, had in view a target of 10 Maunds per acre on an average. The average yield obtained in the eight Farms were as below—

TABLE VI
Yield per acre in Seed Farms (Maunds) as available (8 Farms in 1960)

Wheat	10.3
Barley	12.2
Jowar	5.5
Bajra	6.1
Maize	5.5
Gram	6.3

The data are broadly indicative as only five of the Farms reported yields. It is clear that the yields have to be stepped up in jowar, bajra, maize and gram. In all of the Farms under case study, manures were applied to crops. The wheat crop received 150 to 224 lbs. of ammonium sulphate per acre and 112 to 250 lbs. of super phosphate besides a green manure crop or Farm yard manure in some cases, while jowar and bajra received 3 to 5 tons of Farm yard manure and 100 to 224 lbs. of super phosphate per acre.

(7) *Irrigation*—Many of the State Seed Farms have irrigation facilities. In the case study of eight Seed Farms, the Team observed that the irrigated area was 265 acres or 44 per cent of the total cultivated area and 27 per cent of the total area of 984 acres of these Seed Farms. Of these eight Farms two had irrigation facilities for over 50 per cent of the area, two for 25 per cent of the area and two under twenty per cent and two were without irrigation.

(8) *Building and Quarters*—All the seven Farms studied had a Store each of capacity about 2000 Maunds. Quarters were provided for five of the seven Farm Managers, for 22 out of 31 Ploughmen and none for the Store-keeper-cum-Clerk and Tractor Drivers. Only three Farms had a *Katcha* threshing floor and there was no hard threshing floor. The Team considers that the provision of hard threshing floors for all the Seed Farms is necessary.

(9) *Precautions for maintenance of purity*—While the purity and germination were recorded for all the nucleus seed received, the quality of foundation seed was recorded only in two out of the eight Farms. Except for maintaining separate plots for each variety, other precautions do not appear to be carried out. Rogueing was reported only in two of the eight Farms studied. Insecticides are used for dusting the stored bags.

(10) *Suggestions for improvement of State Seed Farms*—Based on the above studies, the Team recommends the following steps for improvement:

- (i) A regular and adequate supply of nucleus seed to the State Seed Farms should be maintained.
- (ii) Rogueing and other precautions for maintenance of purity should be given due emphasis.
- (iii) Representative samples of the improved seeds from State Seed Farms should be sent to the Economic Botanist for determination of purity and germination and duly approved seeds issued.
- (iv) The soils of the State Seed Farms should be tested and a suitable manurial programme drawn up and other reclamation measures taken to step up production.
- (v) As the setting up of Seed Farms in Government lands results in considerable savings in capital expenditure, these savings should be best utilised for reclamation of the soil and provision of irrigation. The speed of the reclamation as also the construction of Farm buildings, threshing floors etc. should be stepped up.
- (vi) A special course of training for Managers of Seed Farms should be regularly conducted by the Senior Officers of the Department including Economic Botanist, on Farm Layout Crop Planning, Agro-

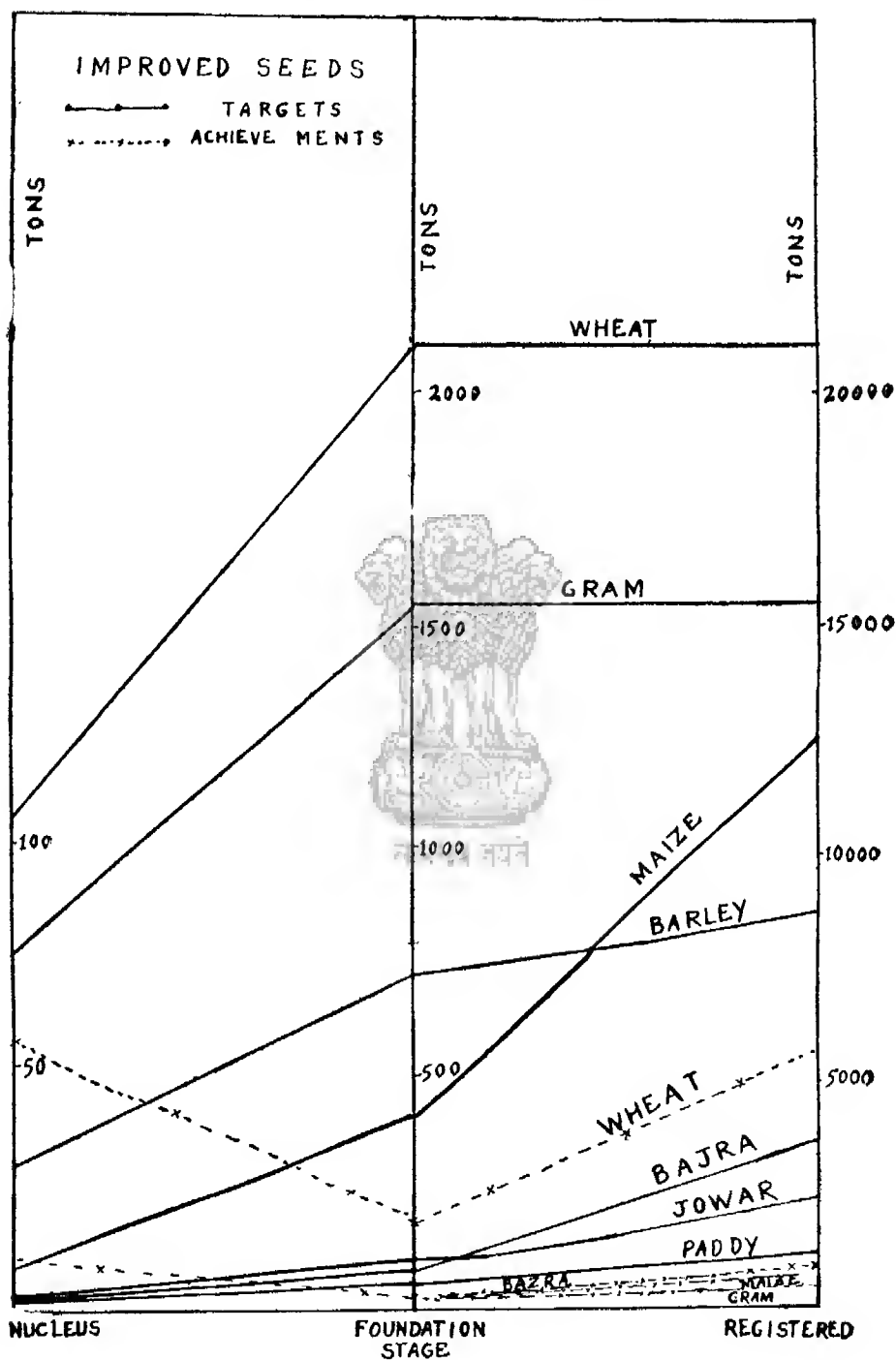
nomy, Identification of improved strains, Maintenance of purity, Soil fertility, Drainage, Reclamation of alkaline soils and Farm accounting.

- (vii) The desirability of employing retired officers possessing good record as Farm Managers may be considered. They are likely to bring about speedy improvement of Farms, step up the production and run the Farms more economically.
- (viii) In Rajasthan the emphasis is mainly on multiplication of improved wheat seeds. Gram and barley should also receive due attention; and
- (ix) There should be an advisory board of farmers from the Blocks to help the Farm Manager in proper functioning of the Seed Farm.



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TARGETS AND ACHIEVEMENTS IN SEED MULTIPLICATION
 FLOW SHEET FROM NUCLEUS TO REGISTERED SEED DISTRIBUTION
 (TONS) 1959-60 RAJASTHAN



CHAPTER V

PRODUCTION OF REGISTERED SEED

(1) *Registered Growers and Production*—There is only one category of Registered Growers whose number varies from Block to Block. The number of Blocks is 196 in 26 districts and there are 72 Registered Growers in Jaipur, 150 in Jodhpur and 320 in Udaipur. In the Kankarauli Block, the Team met 75 Registered Growers. Their holdings were small. One of them having five bighas of land said that he produced about 38 maunds of wheat. Growers complained that they did not get a regular supply of foundation seed nor was their produce regularly procured.

To meet the demand of the Blocks in 1959-60 seeds had to be purchased in the open market, and from the Suratgarh Mechanised Farm. The cultivators told the Team that these seeds were not as pure as the Government Farm Seed. As will be seen from the Table VII below, even after purchase from open market and from Suratgarh Farm, the demand of the Block could not be met fully. It is not understood why procurement from Registered Growers was not made when there was a demand. This matter requires further examination by the Department.

The unsatisfactory quality of seed obtained from the Suratgarh Farm can be improved by provision of a small technical staff to look after seed work in particular. If this is possible, the deficiency in the Registered Seed can be straight away overcome as a large quantity will become available from the Mechanised Farm. If the Agricultural Department could provide some nucleus seed to the Mechanised Farm, it can also produce its own foundation seed without its having to depend on the Agricultural Department. The technical staff provided can attend to the purity control in the production of foundation and Registered seed.

The quantities of Registered and other seeds purchased by the Department during 1959-60 from Registered Growers and through other sources in open market and Suratgarh Farm were as under—

TABLE VII

Quantities of Registered Seed Purchased and the Target

Crop			Quantity of registered seed purchased (Mds.) 1959-60	Quantity of registered seed required to saturate 1/5th area per year	Per cent of target
Bajra	..	..	23,133	94,120	25
Jowar	..	..	10,247	63,126	16
Maize	..	..	11,700	359,100	3
Paddy	..	..	4,600	16,300	29
Wheat	..	..	1,50,000	576,180	26
Barley	..	..	2,000	272,700	0.87
Gram	..	..	4,000	415,420	1.0

The quantity of improved seeds distributed was about 25 per cent of targets in wheat, paddy and bajra and 16 per cent in jowar. The seeds produced by the Registered Growers and that purchased in the market and from Suratgarh Farm were not enough to saturate one-fifth of the crop area in barley, gram and maize. The Team, therefore, suggests that the production and distribution of improved seeds should be arranged in adequate quantities from the Foundation Stage to meet sufficiency requirements.

It was also learnt that purity of seed obtained from Suratgarh Farm and purchased from the open market was not so good as that of Registered Growers. Some of the cultivators who appeared to be quite intelligent, said that they themselves rogue out off type plants from their fields periodically. The Block Development Officer Kankrauli stated that he deputed the entire Block staff for rouging when the crop has eared. This procedure is commendable indeed. It should be followed in other Blocks also.

The Team was also told that in the Kankrauli Block 80 per cent of the wheat area has been covered with improved varieties, C. 591 and N.P. 718. This coverage has not been brought about by a regular supply of Registered Seed to other growers.

There appears to have been little procurement of Registered seed also of other crops such as maize, barley and gram. Since improved strains of these crops are available and are being multiplied, there must be a planned procurement of Registered seed to cover 1/5th of the crop area as envisaged in the plan. Procurement is normally done soon after harvest when prices are not high. As is done in Madhya Pradesh, the Growers should get the seed at the procurement rate and the State should bear the incidental charges and the premium. The Bari or Sawai system is open to malpractices. The one and one-fourth of the quantity of produce in terms of seed supplied that the growers have to return may or may not be pure nor clean enough for seed purpose. No useful objective is served by purchasing inferior quality of produce unfit for seed and disposing it of ultimately in the market. In the opinion of the Team where a Grower is unable to pay more, the seed should be issued to him on credit i.e., on *Taqavi* loan basis. Sufficient credit should also be given for manures and adoption of improved practices.

(2) *The role of Panchayats and Co-operative Societies in improved seed—* Rajasthan is one of the first States in India to introduce the system of Panchayats for execution of developmental work from the year 1959-60. In this State, the work of seed multiplication and distribution at the Village, Block and District levels is watched respectively by the village panchayat, the Block Samiti and the Zilla Parishads. The multiplication of foundation and registered seed has been entrusted to the Panchayat Samities, while the procurement and distribution of seed is being done both by the Panchayat Samities and the Co-operatives, preference being given to the latter. The Zilla Parishad will only co-ordinate the work. The Gramsevak, the Agricultural Extension Officer and the District Agricultural Officer render technical assistance in the production of foundation seed, its distribution to Registered Growers and the procurement of Registered seed. No Registered seed is procured unless it is certified by the Agricultural Extension Officer. According to the procedure laid down, the samples of Registered seed before procurement should be sent to

the District Agricultural Officer and the Economic Botanist for their approval. Unfortunately, in practice, this procedure is not strictly followed.

The actual procurement of Registered seed and its further distribution are entrusted to the Co-operative Societies in the villages, who also receive technical help from the Agricultural Extension Officer. The Co-operative Society procures only such Registered seed as is certified by the Agricultural Extension Officer. The premium paid by the Department originally varied with the quality being 50 nP for 90 to 95 per cent purity and Re. 1/- for 95 to 100 per cent. Now the distribution of seed by the Co-operative Societies to the Growers is done on the advice of the Panchayat and the rates are fixed by the Panchayat Samiti after taking into consideration the prevailing market rate, plus premium and other incidental charges and commission.

(3) *Suggestions for improvement*—Whatever steps may be taken at Research and Seed Multiplication Farms, the whole scheme of sowing improved seeds is likely to end in failure without (a) the active co-operation of progressive Registered Growers to look after seed multiplication with zeal, and (2) co-ordinated programme of procurement and distribution of improved pure seed.

The Team therefore recommends that—

(i) The Extension Officer and Gramsevak and also other Block staff must be properly trained in rouging operation. The controlling officers (the Deputy Director of Agriculture and District Agricultural Officers) must pay surprise visits and record their findings in an inspection book, a copy of which should be sent to the Director of Agriculture.

(ii) There should be a large number of villages served by a fewer number of Registered Growers in each, rather than a smaller number of villages by a large number of Registered Growers. The view has been held that confining distribution of seed to a few villages first for further dispersal would ensure higher purity, besides other advantages like easy collection of seed, its proper storage etc. The State concerned, however, can decide which line to take in the context of the special staff including a Gramsahayak for every village that may be available for seed distribution work.

(iii) With the transfer of improved seed work to the Panchayat organisation, there is great need for co-ordinating with it the technical knowledge available with the Department. For this purpose, the field officer employed by them should be given periodical training in Research Farms and Research Officers should occasionally visit the Block areas to study local problems.

(iv) The quantity of improved seeds produced and distributed which is only $\frac{1}{4}$ of targets for wheat and bajra and small in other crops should be increased to meet the targets.

CHAPTER VI

COVERAGE BY IMPROVED STRAINS

(1) *Coverage by improved varieties*—There is no definite information available regarding coverage by improved strains. During 1958, the Agricultural Department estimated that 14 lakhs out of 22 lakhs under wheat or 64 per cent were covered by improved strains. The Team was however told, that over 90 per cent of the area under wheat has now been covered by improved varieties. The Registered Growers informed the Team that the improved varieties of wheat viz., R. S. 31-1, C. 591 and N.P. 718 have spread over a large area and there has been a general appreciation of these strains, but not with other crops, such as bajra, jowar, maize, barley, gram etc. Evidently it appears that distribution of improved seed of crops other than wheat has not made much headway and to this extent the seed multiplication programme should be strengthened to include crops like gram and barley.

(2) *The plan of coverage of the Agricultural Department*.—The Rajasthan Agricultural Department prepared a plan of distribution of improved seed for the Second Five Year Plan when the State Seed Farms were organised in 1958 and recently another programme for the Third Five Year Plan ending 1965-66. In both these programmes the plans proposed saturating only a portion of the area once in five years.

TABLE VIII
Plan of distribution of Seed for the II and III Five Year Plans by the Agricultural Department, Rajasthan

Crop	II Five Year Plan				III Five Year Plan			
	Expect- ed area in 1960-61 Lakh acres	Area proposed to be covered Lakh acres	Percen- tage of area propos- ed to be covered	Seed require- ment Mds. Lakhs	Expect- ed area in 1965-66 Lakh acres	Area proposed to be covered Lakh acres	% of area program- med	Seed required Mds. Lakhs
Wheat	26.0	25.0	96	5.0	49.3	44.0	89	8.80
Barley	15.0	12.0	80	1.7	20.0	12.0	60	2.10
Gram	28.0	10.0	36	1.0	37.3	12.0	32	1.20
Maize	12.0	9.0	75	0.54	20.0	12.0	60	0.60
Paddy	3.0	1.0	33	0.10	50.0	4.0	80	0.40
Jowar	27.0	7.5	28	0.32	24.5	12.0	49	0.30
Bajra	67.0	40.0	60	0.66	96.5	60.0	62	0.60
Oil Seeds	18.2	6.0	33	0.12	31.2	2.6	8	0.50
Cotton	5.5	5.0	90	0.20	9.4	6.0	64	0.32
Sugarcane	0.75	0.75	100	..	1.2	1.2	100	9.60
Kharif Pulses	..	Not planned			44.5	12.0	27	0.50
Rabi Pulses	..	Not planned			3.0	2.0	67	0.10

Although the above two programmes for the Second and Third Five Year Plans do not propose to saturate the entire area of each crop once in five years, the Team considers that they are based on a realistic approach, taking into account the existing resources of seed and the possible change in cropping with future irrigation schemes. Even if this is carried out, there will be cent percent saturation in the Third Five Year Plan for sugarcane, 90 per cent for wheat, 80 per cent for rice, and 60 per cent for barley, maize, bajra, though the coverage will be relatively small in gram, oil seeds and kharif pulses. In actual practice the distribution of improved seed during the Second Plan year was confined to wheat mainly and even here the quantities distributed were far below requirements to saturate one-fifth of the area every year. In this connection, the Agricultural Department have stated that the quantity of wheat distributed was generally according to the requirement and that the formula of replacing 1/5th of the area with fresh seed every year was not adhered to in certain cases, as the cultivators had their own seed of good quality.

(3) *Suggestions for improvement of distribution of seed*—The Team therefore recommends that—

(1) The programme of multiplication and distribution of improved seeds as drawn up by the Department in Table VIII for the Third Five Year should be carried out vigorously, even though it does not saturate all the crops once in five years.

(2) The multiplication and distribution of crops other than wheat should receive special attention in order to make up for the small coverage by improved strains of bajra, barley, gram, maize, oil seeds and pulses.

(3) A survey on a random sampling basis should be made to determine the coverage by improved strains in Rajasthan under the direction of the statistician.

CHAPTER VII

QUALITY OF SEED

(1) *Nucleus Seed*—The aim of seed multiplication schemes is to maintain a high quality of seed during different stages of multiplication. Quality of seed has reference to high purity and satisfactory germination and it should be reasonably free from weed or other crop seeds, earth, stones etc. Standards prescribed for the nucleus, foundation and Registered seed, should be strictly adhered to in practice. As regard the quality of nucleus seed the Economic Botanist informed the Team that it is of high quality i.e. almost cent per cent in gene ical purity and 98 to 100 per cent in germination. As regards refraction he pointed out that there was no grading machine to sort out immature and other unwanted seeds, but screening is done with the help of sieves. Purity and germination tests are generally carried out.

(2) *Foundation Seed*—As regards the quality of foundation seed it has to be 99 to 100 per cent pure, 92 to 100 per cent in germination and clean according to the prescribed standard. It appears that adequate precautions are not taken to maintain these specifications. At Bassi Farm, visited by the Team, rougeing had not been thoroughly carried out. An entry into the labour record showed that only two labourers were engaged for this operation. They could not have rouged more than a few acres whereas the area under seed multiplication in the crop season was nearly 30 acres. The Farm Museum samples of produce shown to the Team were uniform and clean. Further, there are no hard threshing floors on all the Farms. No records of germination tests were maintained in six of the seven Farms studied. Complaints were made to the Team by the Growers regarding quality of seed distributed in the Block from the Central Government Mechanised Farm, Suratgarh. The samples of the produce had not been sent to the Economic Botanist for his analysis. This should have been done. It appears that adequate tests are not effected to assure the prescribed standard of quality of the foundation seed.

(3) *Registered Seed*—The same state of affairs extends in regard to the maintenance of standard of the Registered seed also. A procedure has been laid down that the produce of Registered Growers should be procured only after its samples have been approved by the Economic Botanist. During the Team's visit to the Central Research Station, Durgapura it was found that only 17 samples were received by him during 1959-60. Their purity ranged from 92 to 97 per cent and germination 87 to 98. Samples showing germination below 90 per cent were rejected. This surprisingly small number of samples forwarded to the Economic Botanist shows that seeds were procured from the Registered Growers in good many cases without obtaining the Economic Botanists' approval.

During the Team's visit to the Kankrauli Block, the Agricultural Extension Officer explained that he and the Gramsevak carry out rougeing regularly in the fields of the Registered Growers. As there were 75 such growers the Team enquired whether the Extension Officer and the Gramsevak could rouge the fields of all these Registered Growers. The Team was informed by the Block

Development Officer that rougeing being a seasonal operation, he employed all the available staff in the Block for this work. This practice is commendable provided all the members of the staff are trained in this operation.

The Registered Growers whom the Team met, said that they themselves remove off type plants from their fields. They said that they grew only a single improved variety of wheat on their entire holding and so there was no possibility of any admixture taking place during harvest and threshing.

(4) *Seed Stores*—There are in all 216 seed stores provided in the State, one for each of the 196 Blocks and one each at the 26 District headquarters. Here mostly the Registered seed is stored after procurement. The Team inspected a store in the Block near Jaipur and found it to be practically empty. All the wheat seed procured had been distributed. The Block Development Officer informed the Team that the seed is properly stored and insecticides are dusted on the bags during storage. He said there was no damage done to the seed stored. The total capacity of these 216 stores is about five lakh maunds. This capacity will have to be increased when procurement and storage of seeds of more crops are undertaken.

The seed multiplication work is at present confined to wheat only and there are no major diseases of a nature calling for preventive measures except, perhaps, smut. The Team was informed that incidence of smut is rare in Rajasthan and so no seed treatment was carried out. Insecticides are used during the storage of the produce.

(5) *Suggestions for improvement of quality of seed*—(i) In the opinion of the Team, a seed testing laboratory should be set up at the Central Research Station, Durgapura and the necessary equipment and staff provided. The Team also recommends as suggested by the Economic Botanist, that a set of cleaning and grading equipment may also be provided.

(ii) Hard threshing floors, big enough in size to cope with the Farm produce should be constructed on the Farms and rougeing of crops insisted upon. The controlling officers of these Farms should be directed to make entries in the inspection books maintained at these Farms, whether rougeing had been properly carried out or not. The samples of the Farm produce should be sent to the Economic Botanist for testing purity, germination and other factors.

(iii) The question of rougeing of the fields of Registered Growers should be carefully examined. The possibility, as a general practice of assigning all available Block staff along with the Agricultural Extension Officer and the Gramsevak as is done in Kankrauli Block should be explored. Where necessary, special staff should be provided for this work and as short course of training of the staff engaged on rougeing should also be organised by the Economic Botanist.

CHAPTER VIII

TYPE OF SEED SCHEMES AND THEIR CO-OPERATIVE EFFICIENCY

(1) *State Seed Farms Scheme*—The scheme of establishment of Seed Multiplication Farms in the Blocks was introduced in Rajasthan only from 1956. Before this no systematic multiplication and distribution of improved seed were done. There was no regular flow of nucleus seed from Research Station to the few Farms which existed, neither was the seed multiplied at these Farms, nor planned distribution organised. The whole programme of multiplication and distribution before 1956 was on an *ad hoc* basis. Growers obtained their requirements of seed from the distantly located Farms every now and then and paid little attention to the maintenance of purity.

With the setting up of the Seed Multiplication Farms in the Blocks the whole programme from the year 1956 has been properly planned for a regular supply of nucleus seed from the Research Station to the Block Farms and of the foundation seed from the latter to the Registered Growers. Foundation seed is produced in Farms maintained by the Panchayat Samities except in a few Farms run by the Department and there is no need for procurement of primary seed at this stage, as was done before. Procurement of Registered seed in adequate quantities to saturate one-fifth of the cropped area every year has been aimed at. There is larger scope for maintenance of purity of seed at the Block Farms as they are directly under the control of the Department. The seed is also made available within easy reach of every cultivator, as these State Seed Farms are established on a Block-wise basis.

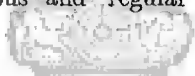
There could be no comparison of this new scheme with the earlier unplanned practices. In the new scheme targets of coverage of cropped area under improved seed have been fixed in such a way that the entire cropped area will be saturated with improved seed within a reasonable period. There after the replacement with fresh seed is also to be effected at the same rate. Naturally this new scheme involved setting up a Farm in each Block, providing facilities and staff, constructing buildings for office and Farm staff, threshing floors, godowns etc., entailing considerable outlay and recurring expenditure. Compared with the benefit, the scheme would confer by saturating the entire cropped area under improved seed within a period of five years, the investment both of recurring and non-recurring nature would be fully compensated and this new undertaking must be considered economically sound. The Block Farms when fully developed would pay their way and in addition will serve as good demonstration centres to the growers on improved cultural practices.

(2) *Types of Schemes for distribution of Registered Seed*—Till the year 1958-59 the procurement and distribution of improved seed were under the direct control of the Agricultural Department and now it has been entrusted to the Panchayat Organisation and Co-operative Societies. The scheme in Rajasthan does not provide a separate agency as the Gramsabhayaks for production of improved seed in the villages, as in some States. The Team considers that such a step is

necessary as the present volume of distribution of seed is only 25 per cent of targets even in wheat and bajra, and hardly one per cent in paddy, gram and maize. The Team therefore recommends intensification of improved seed work by providing one Gramsahayak for each village from among the most progressive Registered Growers to multiply and distribute improved seed, so that every village is self-sufficient for its supply of Registered seeds.

In Rajasthan, a unique procedure was adopted in respect of supply of Foundation Seed to Registered Growers. When a Registered Grower was supplied with a variety of foundation seed in one year he would not be supplied such seed again till a period of five years, fixed for saturating the area. This procedure is commendable as it has the advantage of supplying foundation seed to a larger number of Registered Growers and thereby help quicker spread over larger areas.

(3) *Comparison of the State Seed Farm Scheme with other types of Schemes—* In the State Seed Farm Scheme, there is one advantage that, the number of classes of Registered Growers is reduced to one in most crops as rice, bajra, pulses and minor oil seeds, which have a relatively higher multiplying rate. It is only in the case of such crops as groundnut, wheat and cotton, with a relatively lower rate of multiplication that one more stage of procurement from 'B' Class Growers is necessary. In the special Cotton multiplication scheme four to five stages of multiplication have to be employed and special staff provided. This system cannot be compared to the State Seed Farm system, nor can it apply to the food grains and other crops as a general practice. The special advantages of the State Seed Farm system are (1) the Departmental production of seed in Government owned Farms; (2) the reduction in the number of classes of Registered Growers; (3) planned supply of improved seed to the Blocks; and (4) the continuous and regular flow of improved seed for multiplication in the villages.



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CHAPTER IX

PRIORITIES AND PHASING OF THE PROGRAMME OF SEED MULTIPLICATION

(1) *Priorities*—In Rajasthan the seed multiplication programme has been confined to wheat only. The improved strains R.S. 31-1, N.P. 718 and C. 591 have covered a large area, a great deal of it however by natural spread. There has been no proper phasing of production of nucleus and foundation seed in required quantities nor was a regular supply of foundation seed to the Registered Growers maintained and their produce procured. The distribution of seed at the Block level has been on an *ad hoc* basis.

(i) Priority must therefore first be accorded to systematic production of nucleus, foundation and registered seed in quantities to saturate one-fifth of the cropped area.

(ii) The next priority must be accorded to maintenance of purity of seed in all stages of multiplication. The prescribed standards of quality of nucleus, foundation and Registered seed must be adhered to in practice.

(iii) Third priority must be given to the setting up of the seed testing laboratory where samples of foundation, nucleus and Registered seed could be analysed in large numbers.

(iv) Fourthly, breeding work on the crops bajra, maize, jowar and gram must be intensified. Bajra occupies the largest area and constitutes the main food of the people. There is a great scope for stepping up yield by evolving hybrid barja and it is necessary that a main research station be located at Rajasthan, which has a very large area under the crop.

In the case of maize, trials of hybrid seeds should be undertaken and the most suitable flint hybrid strains for different regions be determined and the production intensified.

Though jowar occupies an area equal to that of wheat it has not so far received the attention it deserves. Considerable breeding material has been collected at Tabiji Research Station. Adequate attention can be given to this crop only if a full fledged section for millets is created under the Economic Botanist.

Unfortunately, gram which covers an area of 43 lakhs has received the least attention. It is also an important subsidiary food crop. To concentrate research work on this crop, a fully equipped section for pulses should also be created under the Economic Botanist.

Ten more seed Farms to be established should be set up as early as possible. The existing Farms should be properly laid out and alkaline portion reclaimed. A regular programme for improving soil fertility should be chalked out by the specialist concerned and implemented for stepping up crop yields. Irrigation facilities should be provided wherever possible without any delay.

(2) *Phasing of the Seed Programme for the Third Five Year Plan*—As already mentioned in Chapter VII (Table VIII) the programme drawn up by the State Agricultural Department for Third Five Year Plan would cover only 32 per cent in gram, 8 per cent in oil seeds, 27 per cent in *Kharif* pulses, and 49 per cent in jowar of the targets required to saturate one fifth of the crop every year. The Team, therefore, recommends that these targets may be increased to provide at least for 60 per cent of saturation requirement of these crops with an intensified programme of multiplication and distribution of seeds of the available improved varieties through Gramsahayaks.



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CHAPTER X

ADMINISTRATION

(1) *Departmental Set-up*—As in the other States, the Director of Agriculture is the Head of the Department. He is assisted by two Joint Directors of Agriculture and Deputy Directors of the Headquarters. On the Research side there is the Economic Botanist, the Plant Pathologist, the Agronomist, the Entomologist and the Chemist. For agricultural education, there are three colleges at Udaipur, Jobner and Ajmer.

On the extension side there is a Deputy Director of Agriculture for each of the four Divisions, while in the fifth Division Kotah, a Joint Director of Agriculture has been appointed instead of a Deputy Director, with a view to intensify the agricultural work in the Chambal commanded area for expeditious utilisation of water. There is one District Agricultural Officer for each District, except Kotah, Jaipur and Ganganagar where an additional District Agricultural Officer has been provided in view of either the largest area or intensive programme. In the districts of Jaisalmer and Bikaner there is one Assistant District Agricultural Officer instead of a District Agricultural Officer as the district work is of less importance there. The District Agricultural Officer is in direct control of seed distribution and multiplication programme in his district. At the Block headquarters there is an Agricultural Extension Officer who is an Agricultural Graduate. Normally there are ten Gramsevak for each Block. Each Gramsevak's Circle consists of 8 to 10 villages. The Agricultural Extension Officer and the Gramsevak are under the Administrative control of the Block Development Officer. For technical work they are under the District Agricultural Officer.

The Economic Botanist, however, pays occasional visits to the districts to study the progress of seed multiplication programme. The Deputy Directors of Agriculture and the District Agricultural Officers are to consult him in regard to popularisation of the improved strains. Samples of seeds of the Registered Growers are to be sent to him for opinion regarding their purity, germination etc. as per the procedure laid down.

As regards co-ordination between the Development Departmental staff and the Deputy Director of Agriculture and the District Agricultural Officers, the Team was told that there is a perfect understanding between these two Departmental wings. With the institution of Panchayat, this co-ordination is likely to be effected by the Panchayat Samiti of the Block, which is in overall charge of all the work. The Panchayat Samiti is, therefore, in charge of the multiplication work in the Block. The District Agricultural Officer is to give technical advice and the extension officer and the Gramsevak have to work directly under this Samiti.

The procurement and distribution of improved seeds are done by the Samities or the Apex Co-operative Marketing Society under the supervision of the Samiti. Distribution is generally done by the Co-operative Society which gets a remuneration of 2½ seers per maund on the quantity distributed.

The funds for procurement of seed are provided by the Samiti which also is responsible for granting credit to cultivators for purchase of seed. The Samiti in turn gets allotments from the Agricultural Department for schemes approved by the Director of Agriculture.

(2) *Suggestions for Improvement of Administration*—With the rapid expansion of the seed multiplication programme in all the Blocks, it is necessary to have a proper check on the quality of seed. The Research Officers whose primary duty is, no doubt, to carry out research must pay frequent visits to the Blocks and inspect the quality of seed multiplied for distribution. They should not confine work to the mere analysis of the samples received by them. Occasional inspection of the fields of the Block seed multiplication Farms and of the Registered Growers is desirable. To enable them to do this work, it is suggested that these officers should be given adequate facilities of transport.

The Team also recommends that there should be a whole time officer at State level to look after seed multiplication work in Rajasthan. The Deputy Director of Agriculture at the headquarters is saddled with other duties and is not able to undertake the intensive work necessary for a State-wide seed programme. For this there should be an officer of the status of a Joint Director of Agriculture so that he is able to give necessary guidance and instruction to the Deputy Directors and District Agricultural Officers and devote his whole time and attention to the seed multiplication work.

Likewise there should be an independent technical Assistant for each district under the District Agricultural Officer to look after seed multiplication, roguing, procurement, distribution and layout of trials to popularise improved strains etc. The duties of the present Agricultural Extension Officers have increased enormously and it is difficult for them to pay adequate attention to seed multiplication work.



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CHAPTER XI

SUMMARY OF RECOMMENDATIONS

I. Recommendations

1. As proposed by the State Department of Agriculture, Specialists for the important crops millets, pulses and oil seeds should be appointed with necessary facilities of staff, equipment and laboratory. The research work on Bajra should be intensified and the setting up of a main station under the Millet specialist examined. [Chap. II (1) (2) (3) and (4)]

2. There should be a Joint Director of Agriculture (Research) for Administration and technical control of all research organisations in the State. [Chap. II (4)]

3. Research on important crops such as barja, maize, jowar and gram which have not received adequate attention should be intensified. [Chap. II(2) & (4)]

4. A suitable strain of hard wheat (T. durum) for growing under dry conditions should be released from the best ones available, from the Indore Substation of the I.A.R.I. [Chap. II(6)]

5. More areas should be assigned for production of nucleus seed of wheat, barley and gram and more State Farms utilized for the purpose. [Chap. III(2)]

6. Reclamation of fallow area and improvements of the seed Farms should be expedited and buildings construction completed. The Farm soil should be analysed and a comprehensive manuring programme chalked out to step up the yield per acre. Roguing and other precautions for maintenance of purity should receive greater attention. [Chap. IV(1), (6), (8) and (10)]

7. For each State Seed Farm there should be an advisory body of farmers of the Block to help the Manager in improving its working. [Chap. IV]

8. Production of foundation and Registered seed should be increased to saturate the crop area once in five years for self-pollinated crops like wheat, bajra, gram and jowar and annually for maize, a cross-pollinated crop. The possibility of utilising the mechanised Farm at Suratgarh to meet the deficiencies in the foundation and Registered seed should be examined. [Chap. IV (10) and Chap. V (1), (3)]

9. Procurement of seed of Registered Growers should be methodical and regular. Along with wheat all other crops seed's should also be procured to meet the targets of sufficiency. [Chap. V]

10. Cash or credit system for sale of seeds should be substituted for *Bari* system, which is open to malpractices and *Taquavi* loans granted to the poorer classes of ryots. The charges on account of premium and incidental expenses should be borne by the State so that a Grower should get the seed at the prevailing market rate. [Chap. V (1)]

11. As the Co-operative Society is being entrusted with the procurement and distribution of seed the procedure of testing seed samples by the Agricultural Department prior to procurement should be strictly enforced for maintaining the quality. [Chap. VII (3)]

12. Available foundation seed may be distributed to a fewer number of Growers in larger number of villages rather than to a large number of Growers in a fewer villages especially when the proposal for posting a Gramsahayak in every village materialises. [Chap. V (3-ii)]

13. A sample survey of the coverage by improved strains should be conducted under the guidance of the Statistician. [Chap. VI]

14. A Seed Testing Laboratory should be set up at the Central Research Station, Durgapura, where a set of cleaning and grading equipment should be provided. [Chap. VII]

15. Hard threshing floors should be constructed on all Farms. [Chap. VII(5)]

16. Rogueing of crops for maintenance of purity should be carried out thoroughly and a short course of training given to the field staff. [Chap. VII(5)]

17. Sufficient credit for seed should be given to the cultivators who should be encouraged to adopt improved practices such as manuring, irrigation, soil conservation etc. in order to reap the full benefit of improved seeds. [Chap. V(1)]

18. The seed multiplication programme and its phasing drawn by the Department of Agriculture for the Third Five Year Plan should be implemented and evaluated periodically, and provision made for saturating the whole of the area under wheat and bajra and at least 60 per cent other crops. [Chap. IX(2)]

19. Adequate facilities of transport should be provided to the Research Officers to pay frequent visits to the Block Farms and fields of Registered Growers and keep a check on the quality of seed produced. [Chap. X(2)]

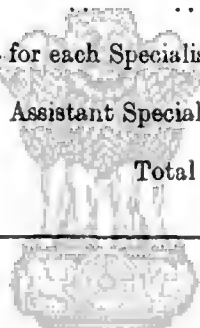
20. There should be an independent officer of the rank of a Joint Director of Agriculture who will be free to devote his whole time and attention to direct and supervise the seed multiplication work. [Chap. X(2)]

21. One extra Technical Assistant should be provided for each district to look after seed work at the District level. [Chap. X(2)]

22. In order to intensify the work of multiplication and distribution of improved seeds in the villages, a Gramsahayak selected from progressive Registered Growers should be provided for each village. [Chap. VIII(2)]

II. Statement of extra staff recommended, and financial requirements

Serial No.	Designation	No. of posts	Per Year Rs.
1	Joint Director of Agriculture (Research)	1	12,000
2	Joint Director of Seeds	1	12,000
3	Technical Assistants one for each district	26	78,000
4	One Crop Specialist each for Millets (Bajra), Pulses and Oil seeds	3	28,800
5	One Assistant Specialist for each Specialist	3	21,600
6	Two Assistants for each Assistant Specialist	6	18,000
Total Amount ..			1,70,400 ANNUAL



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APPENDIX I

Improved Varieties of Crops approved by the State Agricultural Department.

Name of Crop	Variety	Varital Characteristics	Percentage and year of release of the variety	Tract for which recommended	Agronomic conditions for which recommended	Special Economic Features
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Wheat	R.S. 31-1	Short height, awned, dense, club shaped ears, smooth white glumes, bold amber grain.	1954-55 (Local × C. 591)	All districts of Jodhpur and Ajmer Divisions.	For sandy and sandy loam soils where irrigation is only by wells.	Early maturing, resists lodging, and escapes rust and hot winds, bold grain, yield 25-30 maunds per acre.
	C. 591	Tall, black awns felted glumes, dense, fusi-form ears, medium bold, amber lustrous grain.	(Type 8B × Type 9) 1948-49 (N.P. 52 × N.P. 165).	District Ganganagar of Bikaner Division.	For sandy loam and loam soils where irrigation is only by canals.	Grain yield 25-30 mds. per acre, medium, late in maturing, high yielding, better tolerance for yellow rust. Bold lustrous grain.
	N.P. 718	Medium tall, white smooth glumes, curved beak of the outer glume, brush end of the grain hairy, medium bold, amber coloured lustrous grain.	1948-49 (N.P. 52 × N.P. 165).	All districts of Jodhpur, Ajmer, Udaipur and Kotah Divisions.	For sandy loam to clay loam soils under irrigated conditions.	Yield 20-25 mds. per acre, medium in maturity, resistance to black and yellow rust, highly resistant to loose smut, second best variety in yield for Jodhpur and Ajmer Division, most suitable for late sowing conditions.
Barley	R.S. 17	Medium tall, 6-rowed awned, bold heavy grain.	1953-54 (Local)	All barley growing districts of Rajasthan.	For sandy, sandy loam and loam soils under irrigated conditions.	Early maturing, excellent for pearling and brewing and high response to fertilisers. Yield 35-40 mds. per acre.

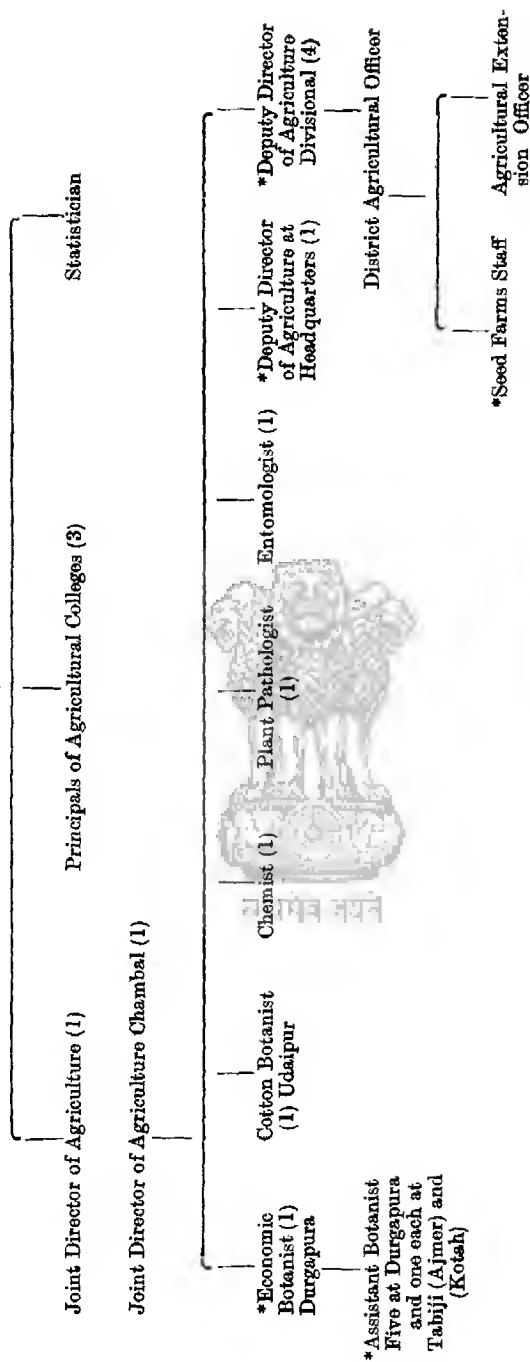
APPENDIX I—contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bajra	R.S.K.	Medium height, bold grain sub conical heads. Ear length 12" to 15".	Local 1956	Jaipur, Ajmer, Bharatpur and Sawaimadhopur districts.	Loamy soils	.. Matures in 90—95 days, high yield (400—500 lbs. per acre).
	R.S.J.	Medium height, long heads cylindrical. Ear length 15"—18".	Local 1956	Alwar, Sikar and Jhunjhunu districts.	Sandy Loams	.. Matures in 90 days, yield 400—450 lbs.
Jowar	R.S. 1	Tall, white bold grain compact heads, thick-pitted stem.	Local 1953	.. Kotah Division	.. Black Cotton Soils	.. Heads emerge in 80 to 85 days and matures in 135—140, days, yield 700—800 lbs.
	R.S. 2	Tall, bold, whitish yellow grain, compact head thick-pitted stem.	Local 1953	.. Kotah Division	.. Black Cotton Soils	.. Head emerges in 75—80 days and crops matures in 130—135, days, yield 700—800 lbs.
Maize	Bassi Selected	Medium height, bold yellow flint grains.	Local 1950	.. All districts of Rajasthan	Sandy loam and loamy soils.	Matures in 110 days, yield 1600—1800 lbs.
Moong	R.S. 4	Medium height, bushy habit, olive black pods, bold shining green grains.	Local 1950	.. All districts of Jaipur and Jodhpur Divisions.	Sandy and Sandy loam soils.	Medium, maturity takes 80—85 days, drought resistant, yield 500—600 lbs.
Groundnut	R.S. 1	Spreading habit bold, seeded, deeply reticulated shell.	Local 1953	Jaipur Divisions and Sri Ganganagar District.	Sandy and Sandy soils	Medium in maturity, takes 150—160 days, Soil percentage 43.8 drought resistant, yield 1000 lbs. per acre.
Gram	R.S. 10	Violet flowers, grain medium yellow in colours.	Local 1950-51	Ajmer and Kotah Divisions and Ganganagar districts.	For loamy and Black Cotton soils.	Medium early in maturity, yield about 800 lbs. per acre.
Zeera	R.S. 1	Shallow furrows on seed, Seed slightly hairy, bold with medium curvature.	Local	.. All districts of Rajasthan	For loam and heavy soils	High yielding. Seed yield 5 to 7 maunds per acre.

APPENDIX II

Set-up of the Department of Agriculture

DIRECTOR OF AGRICULTURE



*These Officers are connected with Seed Multiplication work.

APPENDIX III

List of places visited and persons interviewed

Ministers and Officials of the State contacted	Name of Agricultural Stations visited	Places where meetings of Registered Growers were held	Names of Seed Farms inspected	Block visited	Special meetings held
(1) Shri Nethuram Mirdha, Minister for Agriculture	1. Central Research Station at Durgapura (Jaipur.)	1. Bassi Foundation Seed Farm.	1. Bassi (Jaipur).	1. Kankranli (Udaipur).	A special meeting was held between the seed Multiplication Team and the Minister for Agriculture and other officials on 13th January 1961 where discussion was held on setting up 100 acre Seed Multiplication Farms on Government land; handing over seed distribution to the Panchayat; Research on important crops like Bajra, Jowar, Maize, Gram and saturation of the area by improved seed, maintenance of purity of seed etc.
(2) Shri Shiva Shankar, Sharma, I.A.S., Secretary, Agriculture Department.	2. Tabiji Research Sub-station.	2. Kankranli Block.	2. Sardargarh (Udaipur)		
(3) Shri U.S. Menon, Deputy Secretary, Agriculture Department.			3. Mandore (Jodhpur).		
(4) Sardar Samsher Singh, Joint Director of Agriculture.					
(5) Shri M.P. Bhatnagar, Economic Botanist.					
(6) Shri U.S. Badal, Deputy Director of Agriculture (Headquarters).					
(7) Deputy Director of Agriculture, Udaipur.					
(8) Deputy Director of Agriculture, Jodhpur.					
(9) Principal, Agricultural College, Udaipur.					

APPENDIX IV
Case Studies of Three Seed Multiplication Farms.

Name of the Farm	Tabiji	Lava Sardargarh	Barwa
Year when established	.. 1959	.. 1957	.. 1958.
Location of the Farm	.. Near Tabiji Research Sub-station	In Anet Tehsil of Udaipur Dist.	Near Padsoli mechanised Farm in Jaipur District.
Area of the Farm	.. 86 acres	.. 105.5 acres	.. 124 acres.
Irrigation resources	.. Small Wells—19	.. Wells & Canals, Two pumping sets, 9 acres irrigation in 1960-61.	Canal being constructed.
Staff provided	.. One Farm Manager (Agri. Grad) Two Lower Division Clerks. Four Ploughmen.	One Farm Manager One Lower Division Clerk (Store-keeper.) Four Ploughmen. One Tractor Driver.	Same as at Sardargarh Farm.
Buildings provided	.. Nil	.. One hard threshing floor 30' x 30' maunds. One Seed store to store upto 800 maunds. One office-cum-residential building to be completed. Three ploughmen's quarters to be constructed. One Store keeper's quarter and One Driver's quarter to be completed.	One Farm Manager's residential cum-office building. One bullock shed. Ploughmen's quarters. One Seed Store. These buildings are almost complete. No provision of hard threshing floor.

APPENDIX IV—*contd.*

Name of the Farm	Tabiji	Lava Sardargarh	Barwa
Crops grown	<p>1959-60</p> <p>Maize—3 acres, Bajra—5 acres, Moong—1 acre, Cowpea & Green Manure—35 acres, Wheat—43 acres Barley—9 acres.</p>	<p>1959-61</p> <p>Moong—7 acres, Til—8 acres, Maize—35 acres, Gram—8 acres Wheat—13 acres, Potato—2 acres Barley—18 acres, Peas—29½ acres Kharif cotton—3 acres.</p>	<p>1959-60</p> <p>Wheat NP 718—57 acres. Wheat C/591—26 acres. Barley—6 acres. Gram—21.6 acres.</p>
Crop out-turns	<p>.. ..</p> <p>Foundation Seed produced during past three years: Wheat R. S. 31—3-600 mds. Wheat NP 718—300 mds. Barley R.S. 17—200 mds. Maize Bassi selection—50 mds. Bajra R.S.J. 1—88 mds. Moong R.S. 4—4 mds.</p>	<p>1959-60</p> <p>Wheat—40½ mds. Gram—4 mds. Barley—25 mds. Peas—½ md. The crop did not appear to give an out-turn of 10 mds. per acre of wheat.</p> <p>1960-61</p> <p>Moong—3½ mds. Til—13½ mds. Maize—55 mds. Cotton—5 mds.</p>	<p>1959-60</p> <p>Wheat NP 718—130 mds. Wheat C 591—576 mds. Barley R.S. 17—139 mds. Gram R.S. 10—260 mds.</p>

APPENDIX IV—contd.

Name of Farm	Tabiji	Lava Sardiargarh Farm	Barwa
Crop out turn per acre	..	1959-60	1959-60
..	Not available. The Farm was started in February 1959 and the figures of Foundation seed produce are from the area before it was converted into seed farm.	Moong .. 1-8 mds. Til .. 0-009 mds. Maize .. 17-6 mds. Gram .. 0-9 mds. Wheat .. 9-5 mds. Barley .. 8-3 mds.	Wheat NP 718 .. 23 mds. Wheat C 591 .. 22 mds. Barley R.S. .. 17 mds. Gram .. 16 mds. Peas .. 6 mds.
Nucleus seed received from	..	1958-59	1960-61
..	All from Tabiji Research Sub-station and in adequate quantities.	Wheat .. 15 mds.	Tabiji Durgapura Farm
Cost of cultivation of crops per acre	..	1959-60	1960-61
..	Wheat .. 43 mds. Barley .. 11 mds. Maize .. 30 seers .. 18 mds. from Rest of the area is sown with the Durgapura Farm produce.	Wheat .. 15 mds. Barley .. 19 mds. Gram .. 7 mds.	Wheat R.S. 31-1 20 mds. 5 mds. Wheat C. 591 .. 6 mds. 5 mds. Barley R.S. 17 .. Nil 10 mds. Rest of the area is sown with the foundation seed from Padsoli Farm. Not available.
Cost of cultivation of crops per acre	..	1959-60	1959-60
..	Wheat .. Rs. 300 Barley .. Rs. 210 Bajra .. Rs. 90 Moong .. Rs. 80	Not available.	(a) Expenditure Recurring—Rs. 17,820 Non-recurring Rs. 3,131.
Financial position	..	1958-59	1959-60
(a) Expenditure	..	(a) Expenditure Recurring—Rs. 13,000 Non-recurring Rs. 30,501.	(b) Receipts Rs. 1,624
(b) Receipts	..	..	..
Foundation seed produced at the Farm, how disposed?	..	..	..
Remarks	..	..	..

The Farm is well situated near the Tabiji Research Sub-station. The layout is in progress and the crops appeared to be quite good. Irrigation resources are being augmented. The building should be constructed without delay.

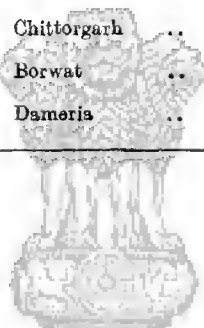
The farm site is not good. There are large alkali patches, which will take years to leach off. The management should be better and lay out carried out as earlier as possible.

The Farm site is good as also the management. The crops were good. The channel (irrigation) construction should be speeded up. The soil is good and with irrigation bumper outturns can be obtained.

APPENDIX V

*Statement showing the Income and Expenditure on the Farms
(1959-60)*

S. No.	Name of District	Name of the Farm	Expenditure (Rs.)	Income (Rs.)
1	Bharatpur . .	.. Sewar	13,159	4,678
2	Sawaimadhopur	.. Sawaimadhopur Malarna Dungar ..	17,953 28,273	19,042 1,074
3	Alwar ..	.. Tinkarori	23,531	3,592
4	Jaipur ..	.. Badwa Durgapura	16,422 37,782	1,625 6,161
5	Udaipur ..	.. Mavli Sardargarh	14,194 19,113	15,387 3,675
6	Bhilwara ..	.. Mejadam Rupahali	15,113 14,310	3,675 1,383
7	Chittorgarh Chittorgarh	14,241	5,680
8	Banswara Borwat	8,624	832
9	Dungarpur Dameria	19,409	5,844



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APPENDIX VI

Comments of the Rajasthan Government on the Report of the Seed Multiplication Team for Rajasthan

In their letter F. 313(12)-Agri/Gr. II/61 dated 10th August 1961, the Government of Rajasthan, Agricultural Department made valuable comments on the Report giving up to date data regarding the staff, the crops and the State Seed Farms. These have been incorporated in the Report.

The following general remarks of the Rajasthan Government on the Team Report are given in the extracts below—

Page 11—Since most of the Farms are in the stage of development, it will not be expedient to compare the income and expenditure so as to work out profits and loss now. The para profit and loss along with the Appendix may be deleted.

Page 16—It is a well known fact that the cost of seed is higher at the sowing time than at the harvest time. As such the cultivators are required to pay more than the price at which their produce is purchased. There is however no complaint from the Growers in this regard as they can return the seed in kind instead of cash, if they desire.

Page 19—The State Department of Agriculture is quite conscious of the systematic production of seed. It will however take some time for the Extension staff and the cultivators to follow the system of multiplication in detail. But in so far as the quality of seed is concerned due attention is being paid to it.

Page 20—Purity and germination tests are generally carried out for nucleus seed.

Page 21—The quantity of wheat seed distributed was generally according to the requirement. The formula of replacing 1/5th of the area with fresh seed was however not adhered to in certain cases, as the cultivators had their own seed of good quality.

Sd/- B. N. MATHUR
Deputy Director

APPENDIX VII

Copy of letter No.F-14-6/61-GMF (Go), dated the 11th September, 1961 from the Ministry of Food and Agriculture (Department of Agriculture), Government of India, New Delhi, on the Report of the Seed Multiplication Team for Rajasthan State

With reference to your letter No. COPP/SMT/649 dated the 31st July, 1961, on the subject mentioned above, I am directed to say that this Ministry is generally in agreement with the recommendations made in the Report by the Seed Multiplication Team except in the following cases—

Seed requirements (Page 8 of the Report)—Seed requirements are calculated on the basis of saturating 1/5th of the total cropped area every year. In this arrangement self-pollinated crops like paddy and wheat, partially cross pollinated crops like cotton and mostly cross pollinated crops like maize have all been clubbed together. It is better that the recommendation of the Standing Expert Committee on Seeds is used as the basis for the calculation, according to which 1/5th of the area will be saturated for self-pollinated crops and the entire area for cross pollinated crops. The Seed Multiplication Team may perhaps revise their calculation on this principle for Jowar, Bajra and Maize under requirement for saturation in Table II.

Recommendation No. 8 (Page 29 of the Report)—A distinction has to be made between self-pollinated and cross pollinated crops. In a period of five years seed renewal may be once for self-fertilised crops like wheat but it should be annual for cross-pollinated crops like maize.

Recommendation No. 12 (page 37 of the Report)—It is considered that too much dispersal of foundation seed is likely to lead to the production of seed of low purity. On the other hand, if this seed is supplied to a fewer number of selected Registered Growers, it will ensure higher purity, besides other advantages, like easy collection of seed from the Registered Growers, its proper storage, etc. The creation of "one Seed Village" in each Block to serve as a focal point for further dispersal of seeds is likely to lead to much better results. This was also the view of the most of the foreign experts who had visited India from time to time.

STUDIES MADE BY THE SEED MULTIPLICATION TEAM

The Seed Multiplication Team undertook studies of Seed Multiplication Farms in the following States and made separate Reports on them:—

1. Himachal Pradesh.

2. Madras.

3. Mysore:

4. Madhya Pradesh.

5. Maharashtra.

6. Rajasthan.

7. West Bengal.

8. Punjab.



Besides its Reports on Individual States, the Team also Made an All-India Report. All these Reports are being published.

1962

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